

What We Claim Is:

1. A method for providing high connectivity communications over a Time Division Multiplexed (TDM) and Wavelength Division Multiplexed (WDM) packet-switched optical ring network having a plurality of nodes connected thereto comprising the steps of:

creating, at one of said plurality of nodes, a composite packet;

dropping a composite packet being routed over said packet-switched optical ring network destined for said one of a plurality of nodes of said packet-switched optical ring network from said packet-switched optical ring network;

adding said composite packet created by said one of said plurality of nodes into said packet-switched optical ring network; and

routing said composite packet to a destination node.

2. A method for providing high connectivity communications over a Time Division Multiplexed (TDM) and Wavelength Division Multiplexed (WDM) packet-switched optical ring network having a plurality of nodes connected thereto comprising the steps of:

creating, at one of said plurality of nodes, a composite packet;

dropping a composite packet being routed over said packet-switched optical ring network destined for said one of a plurality of nodes of said packet-switched optical ring network from said packet-switched optical ring network;

adding to an empty photonic time slot said composite packet created by one of said plurality of nodes into said packet-switched optical ring network; and

routing said photonic time slot comprising said composite packet to a destination node.

3. The method according to claim 1, wherein said composite packet comprises an entire packet.

4. The method according to claim 1, wherein said composite packet comprises a portion of an entire packet.

5. The method according to claim 1, wherein said creating step further comprises the steps of:

serially generating a plurality of packets, each packet being generated at a different wavelength; and

stacking said plurality of packets to form said composite packet.

6. The method according to claim 1, wherein said packet-switched optical ring network is a point-to-point network.

7. The method according to claim 1, further comprising the step of bypassing said composite packet at a given node depending upon a state of an optical switch.

8. The method according to claim 1, wherein said dropped composite packet destined for said one of said plurality of nodes of said composite packet-switched optical ring network is further distributed to a plurality of user sites connected to said one of said plurality of

nodes by using Wavelength Division Multiplexing (WDM) techniques according to said constituent wavelengths of said composite packet.

9. The method according to claim 1, wherein said composite packet destined for said one of said plurality of nodes of said packet-switched optical ring network is further detected in parallel.

10. The method according to claim 7, wherein a wavelength not matching a wavelength of a fiber Bragg grating (FBG) bypasses the node transparently.

11. The method according to claim 1, further comprising the step of adding "thru" composite packets in said photonic time slot to composite packets created at said one of said plurality of nodes.

12. The method according to claim 8, wherein said composite packet destined for said one of said plurality of nodes is recovered and re-serialized into individual packets.

13. The method according to claim 9, wherein said composite packet destined for said one of said plurality of nodes is recovered and re-serialized into individual packets.

14. A method for providing high connectivity communications over a packet-switched optical ring network having a plurality of nodes connected thereto comprising the steps of:

creating, at one of said plurality of nodes, a composite packet;

dropping a composite packet in a photonic time slot being routed over said packet-switched optical ring network destined for said one of a plurality of nodes of said packet-switched optical ring network from said packet-switched optical ring network;

simultaneously adding to said photonic time slot said composite packet created by said one of said plurality of nodes into said packet-switched optical ring network; and

routing said photonic time slot comprising said composite packet to a destination node.

15. The method according to claim 14, wherein a wavelength not matching a wavelength fiber Bragg grating (FBG) passes through the node transparently.

16. A method for providing high connectivity communications over a packet-switched optical ring network having a plurality of nodes connected thereto comprising the steps of:

creating, at one of said plurality of nodes, a composite packet;

dropping a composite packet in a photonic time slot being routed over said packet-switched optical ring network destined for said one of a plurality of nodes of said packet-switched optical ring network from said packet-switched optical ring network;

adding to said photonic time slot said composite packet created by said one of said plurality of nodes into said packet-switched optical ring network; and

routing said photonic time slot comprising said composite packet to a destination node.

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